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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| In re Application of: |) | |
| | : | Examiner: Not Yet Assigned |
| ANDREW R. COKER |) | |
| | : | Group Art Unit: NYA |
| Application No.: 09/668,461 |) | |
| | : | |
| Filed: September 25, 2000 |) | |
| | : | |
| For: PRINT DRIVER FOR GENERAL |) | |
| APPLICATIONS | : | October 27, 2000 |
| |) | |

Commissioner for Patents
Washington, D.C. 20231

CLAIM TO PRIORITY

Sir:

Applicant hereby claims priority under the International Convention and all rights to which he is entitled under 35 U.S.C. § 119 based upon the following Australian Priority Application:

PQ3142, filed September 29, 1999.

A certified copy of the priority document is enclosed.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

Respectfully submitted,


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NY_MAIN 120629 v 1



09/668,461
G.A.U.: NYA



Patent Office
Canberra

I, KAY WARD, ACTING MANAGER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PQ 3142 for a patent by CANON KABUSHIKI KAISHA filed on 29 September 1999.

I further certify that pursuant to the provisions of Section 38(1) of the Patents Act 1990 a complete specification was filed on 22 September 2000 and it is an associated application to Provisional Application No. PQ 3142 and has been allocated No. 61265/00.

WITNESS my hand this
Sixth day of October 2000

K Ward

KAY WARD
ACTING MANAGER EXAMINATION
SUPPORT AND SALES



**CERTIFIED COPY OF
PRIORITY DOCUMENT**

ORIGINAL

AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION FOR THE INVENTION ENTITLED:

Print Driver for General Applications

Name of Inventor: Andrew R Coker

Name and Address
of Applicant: Canon Kabushiki Kaisha, incorporated in Japan, of 30-2,
Shimomaruko 3-chome, Ohta-ku, Tokyo, 146, JAPAN

This invention is best described in the following statement:

PRINT DRIVER FOR GENERAL APPLICATIONS

Copyright Notice

This patent specification contains material that is subject to copyright protection.

5 The copyright owner has no objection to the reproduction of this patent specification or related materials from associated patent office files for the purposes of review, but otherwise reserves all copyright whatsoever.

Technical Field of the Invention

10 The present invention relates generally to the field of computer device drivers, and in particular, to print drivers. The present invention relates to a system, method and apparatus for printing a print job from a local device to a remote printer. The invention also relates to a computer program product including a computer readable medium having recorded thereon a computer program for printing a print job.

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Background Art

Fig. 1 is a system level block representation of a computer 112 attached to a local printer 108. A local application 100 running on the computer 112 receives an input 116 from a user (not shown). Use of the local application 100 results in an internal representation 118 being produced within the application 100, and this can be stored as a print file 102. The nature of the internal representation 118, and the print files 102, will depend upon the specifics of the local application 100. Therefore, if the local application 100 is a word processor for example, the internal representation 118 and the corresponding print files 102 correspond to word processing documents. The internal representation 118 of a document, can be retrieved from a stored print file 102, or be directly produced by interaction with the user as depicted by the arrow 116, and in both instances can be conveyed by means of a printer drive software application 106 to the local printer 108. The print file 102, and its internal representation 118, will be referred to interchangeably in the rest of the specification, the particular meaning intended being clear from the context. The printer driver 106 acts as a mediation software application between the computer 112, and the particular local printer 108 to which the print file 102 is being printed. The printer driver thus enables the local printer to be made compatible with the computer, allowing a printed output 110 to be produced. For general

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convenience, the computer 112 and local printer system 114 are typically situated in close proximity to each other.

In the event that the computer 112 and local printer system 114 are connected to each other by means of a local area network, or LAN, (not shown), the computer 112 can have at its disposal a number of different printer systems 114. In such an event, a number of different types of local printer can be connected to the LAN, and the computer 112 requires a specific printer driver 106 for each different printer 108. At least two problems are apparent in the aforementioned arrangement. In the first instance, a possibly large number of printer drivers must be installed on the computer so that the various printer facilities available on the LAN can be accessed. Secondly, the user of the computer is typically unaware of new devices which have been added to the LAN, or disconnected from the LAN. Consequently, the user is unable to take advantage of any new capabilities which may have been added, and is also not fully updated as to which capabilities may have been removed.

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Disclosure of the Invention

It is an object of the present invention to substantially overcome, or at least ameliorate, one or more disadvantages of existing arrangements.

According to a first aspect of the invention, there is provided a system for printing a print job from a local device to a remote printer being one of a set of printers, the system comprising:

- a local print process driver adapted to receive and prepare the local print job according to a first set of attributes;
- a print application, adapted to receive the prepared print job and to print said job on the remote printer, the remote printer being compatible with the first set of attributes, the application being further adapted to update the local print process driver in regard to attributes associated with the set of printers.

According to a second aspect of the invention, there is provided a print process driver adapted to receive and prepare, according to a first set of attributes, a local print job for printing on a remote printer being one of a set of printers, the first set of attributes being related to attributes associated with the set of printers, said print process driver being updated by a print application in regard to the associated attributes.

According to another aspect of the invention, there is provided a method of printing a print job from a local device to a remote printer being one of a set of printers, the method comprising the steps of:

- receiving a local print job by a print process driver;
- 5 preparing the local print job according to a first set of attributes;
- conveying the prepared print job to a print application, the application printing the job on the remote printer, the printer being compatible with the first set of attributes;
- and

10 updating by the print process driver in regard to attributes associated with the set of printers, said updating being performed in conjunction with the print application.

According to another aspect of the invention there is provided a computer program product including a computer readable medium having recorded thereon a computer program for printing a print job from a local device to a remote printer being one of a set of printers, the computer program comprising:

- 15 reception process steps for receiving a local print job by a print process driver;
- preparation process steps for preparing the local print job according to a first set of attributes;

20 conveying process steps for conveying the prepared print job to a print application, the application printing the job on the remote printer, the printer being compatible with the first set of attributes; and

updating process steps for updating by the print driver in regard to attributes associated with the set of printers, said updating being performed in conjunction with the print application.

25 **Brief Description of the Drawings**

A number of preferred embodiments of the present invention will now be described with reference to the drawings, in which:

Fig. 1 is a system level block representation of a computer/printer arrangement in the prior art;

30 Fig. 2 shows a system level block representation of the preferred embodiment;

Fig. 3 presents a more detailed view of a print process driver illustrated in Fig. 2;

Fig. 4 shows a process flow diagram whereby a print job is printed in the preferred embodiment;

Fig. 5 shows an illustrative “dialog box” associated with the print process driver in Fig. 3; and

Fig. 6 is a schematic block diagram of a general purpose computer upon which the preferred embodiment of the present invention can be practiced.

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Detailed Description including Best Mode

Where reference is made in any one or more of the accompanying drawings to steps and/or features, which have the same reference numerals, those steps and/or features have for the purposes of this description the same function(s) or operation(s), unless the
10 contrary intention appears.

In the context of this specification, the word “comprising” means “including principally but not necessarily solely” or “having” or “including” and not “consisting only of”. Variations of the word comprising, such as “comprise” and “comprises” have corresponding meanings.

15 Fig. 2 shows a computer 112 connected to a print system 222 by two lines 206, 208. This direct connection is shown in Fig. 2 for ease of representation, however it is apparent that the aforementioned direct lines can, in fact, be replaced by a network (not shown explicitly). Fig. 2 further shows how the computer 112 is able to print a print file 102 using one of a set of remote printers 216. As described in relation to Fig. 1, it is
20 understood that the print file 102 is printed, for example, after “reading” the print file from storage, and converting it into an internal representation 118. Alternately, the internal representation 118 can be produced directly by interaction between the user and the local application 100 as depicted by the arrow 116. A local application 100 running on the computer 112 produces a print file 102 which is conveyed to a print process driver
25 200 as depicted by an arrow 104. The print process driver 200 converts the print file 102 into print file data 204 according to a first set of attributes which the user of the computer 112 has specified in relation to the print job. The aforementioned set of attributes is called a Service Item, which the user specifies in an interactive process 226 described in relation to Figs. 3, 4 and 5. A print application 210, which belongs conceptually to the
30 printer system 222, is able to receive the print file data 204 as depicted by an arrow 206. In addition, the print application 210 communicates with the print process driver 200 as depicted by a bi-directional arrow 208. This communication between the print application 210 and the print process driver 200 allows the print application 210 which is “network printer aware” to communicate updating information regarding the set of

printers 216 to the print process driver 200. In so doing, the print application 210 provides the user of the computer 112 with an up to date perception of printer capabilities provided by the set of remote printers 216, thus allowing the user to choose from an updated set of printer capabilities available on the LAN. The print file 102 generated by the application 100 is processed by the print process driver 200 to produce the print file data 204. This process, extending from the local application 100 and resulting in the print file data 204, can be repeated by the user in respect of multiple local applications 100, with the resultant print file data 204 for each local application 100 being stored locally on the machine 112. When the user wishes to print one or more of the print file data 204, the user initiates communication between the computer 112 and the print application 210. Once this communication is established, the print application 210 can retrieve the print file data 204, and by means of a remote printer server 212, the print application 210 can convey the print file data 204 to one of a set of remote printers 216. The particular remote printer selected from the set of remote printers 216 depends upon the particular attributes in the Service Item selected by the user of the computer 112 using process 226 in regard to each specific print file data 204. The server 212 makes an assessment of the Service Item attributes selected by the user, and selects an appropriate printer from the remote set 216. The selected printer then produces the desired printed output 220. In addition, the print file data 204 is rendered for printing by either or both the server 212 and a processor in the selected printer from the set of printers 216.

Fig. 3 provides more detail in regard to the operation of the print process driver 200. The print file 102 is conveyed to the print process driver 200 as depicted by the arrow 104, the print file being delivered to a file data conversion process 300. This process 300 delivers a converted print file data set 204 as depicted by an arrow 202. As noted in regard to Fig. 2, the print file data 204 is stored locally on the computer 112, pending its transmission to a remote printer. The print application 210 communicates with the print process driver 200, as depicted by the bi-directional arrow 208. This bi-directional communication takes place between the print application 210 and the print drive file process 302, and also the icon bit map process 304. The print drive file process 302 is updated by the print application 210 in regard to attributes of the set of remote printers 216 which is currently connected to the network. It will be apparent that the remote devices connected to the aforementioned network are typically in a constant state of flux, with new printers being added, and other printers being removed, on an ongoing basis. The updating process between the print application 210 and the print drive file

process 302 thus provides the user of the computer 110 with an updated picture of the printer capabilities available for printing. The print application 210 also communicates icon bit maps to the icon bit map process 304, as part of the updating process. These icon bit maps are used in providing explanatory information to the user, when the user makes a print attribute selection. The Service Selection process 226 allows the user to specify the Service Item, by making reference to the updated print drive file 302 and the icon bit maps 304 as depicted by an arrow 228. As noted previously, the user is able to produce print file data 204, and store this data locally on the computer 112, only later sending it off for printing. In the event that the available remote printer capabilities on the network have changed between the production of the print file data 204 and the transmission of the print job to the remote printer, an error message will be produced for the user, so that the print file 102 can be read from a memory (not shown) in the computer 112, where it has typically been stored, and re-processed by the print process driver 200 using an updated set of attributes defined by a new Service Item specification. The file data conversion process 300 converts a text listing representation of the print file 102 in a first page description language (PDL) used by the local application 100, to a text listing representation in a second page description language used by the to-be-selected remote printer from the remote printer set 216. For example, the family of Windows® operating systems uses Graphic Device Interface functions (GDI)® to place graphical components on the printed page when printing a print file 102 from a local application 100. The print process driver 200, using the file data conversion process 300, produces the required converted print file data to be stored as stored print file data 204 on the local machine, pending its transmission to a remote printer.

Fig 4 shows a process flow diagram for the preferred embodiment. Decision process 400 detects whether a job is available for printing. If a print job is available, the process is directed to the Service Item selection process 226. The process 226 causes a dialogue to be initiated with the user, whereby the user selects a set of attributes defining how the job is to be printed. The aforementioned set of attributes are called a Service Item which comprises a variety of parameters associated with available printer models. These parameters include, for each printer model, paper sizes, stationery types, colour sets, available resolution, paper orientation, and in addition, possibly special services such as printing to sheets of stickers or business cards. Once the service item is selected and specified in the process 226, the overall process is directed to a conversion process 406 where the Service Item and the print file 102, presently defined in a first page description

language used by the local application 100, is converted to a second page description language defined by the service item. Thereafter, the overall process is directed to a storage process 408, whereupon the converted data file is locally stored, pending printing.

Fig. 5 depicts a "dialog box" in the Windows® environment which is produced by the Service Item selection process 226 described in relation to Fig. 4. The dialog box has two views 500, and 502, these views corresponding to the "Service" election tab 512, and the "Layout" selection tab 514 respectively. Considering the service view 500, the user is able, by operating the selection scroll bar 504, to select from a range of available service items. In Fig. 5, the user has selected a service item "A4 Photo Print", this being explained by explanatory text 508, and an explanatory graphic icon 506. In addition, the user has the ability to select a paper orientation 510 and other attributes evident in the service view 500. Turning to the layout view 502, other selectable service item attributes are evident.

The method of printing a print job is preferably practiced using a conventional general-purpose computer system 600, such as that shown in Fig. 6 wherein the process of Fig. 4 may be implemented as software, such as an application program executing within the computer system 600. In particular, the steps of the method of printing a print job are effected by instructions in the software that are carried out by the computer. The software may be divided into two separate parts; one part for carrying out the printing a print job methods, and another part to manage the user interface between the latter and the user. The software may be stored in a computer readable medium, including the storage devices described below, for example. The software is loaded into the computer from the computer readable medium, and then executed by the computer. A computer readable medium having such software or computer program recorded on it is a computer program product. The use of the computer program product in the computer preferably effects an advantageous apparatus for printing a print job in accordance with the embodiments of the invention.

The computer system 600 comprises a computer module 601, input devices such as a keyboard 602 and mouse 603, output devices including a printer 615 and a display device 614. A Modulator-Demodulator (Modem) transceiver device 616 is used by the computer module 601 for communicating to and from a communications network 620, for example connectable via a telephone line 621 or other functional medium. The modem 616 can be used to obtain access to the Internet, and other network systems, such as a Local Area Network (LAN) or a Wide Area Network (WAN).

The computer module 601 typically includes at least one processor unit 605, a memory unit 606, for example formed from semiconductor random access memory (RAM) and read only memory (ROM), input/output (I/O) interfaces including a video interface 607, and an I/O interface 613 for the keyboard 602 and mouse 603 and
5 optionally a joystick (not illustrated), and an interface 608 for the modem 616. A storage device 609 is provided and typically includes a hard disk drive 610 and a floppy disk drive 611. A magnetic tape drive (not illustrated) may also be used. A CD-ROM drive 612 is typically provided as a non-volatile source of data. The components 605 to 613 of the computer module 601, typically communicate via an interconnected bus 604
10 and in a manner which results in a conventional mode of operation of the computer system 600 known to those in the relevant art. Examples of computers on which the embodiments can be practised include IBM-PC's and compatibles, Sun Sparcstations or alike computer systems evolved therefrom.

Typically, the application program of the preferred embodiment is resident on
15 the hard disk drive 610 and read and controlled in its execution by the processor 605. Intermediate storage of the program and any data fetched from the network 620 may be accomplished using the semiconductor memory 606, possibly in concert with the hard disk drive 610. In some instances, the application program may be supplied to the user encoded on a CD-ROM or floppy disk and read via the corresponding drive 612 or 611,
20 or alternatively may be read by the user from the network 620 via the modem device 616. Still further, the software can also be loaded into the computer system 600 from other computer readable medium including magnetic tape, a ROM or integrated circuit, a magneto-optical disk, a radio or infra-red transmission channel between the computer module 601 and another device, a computer readable card such as a PCMCIA card, and
25 the Internet and Intranets including email transmissions and information recorded on websites and the like. The foregoing is merely exemplary of relevant computer readable mediums. Other computer readable mediums may be practiced without departing from the scope and spirit of the invention.

The method of printing a print job may alternatively be implemented in
30 dedicated hardware such as one or more integrated circuits performing the necessary functions or sub functions. Such dedicated hardware may include graphic processors, digital signal processors, or one or more microprocessors and associated memories.

Industrial Applicability

It is apparent from the above that the embodiment(s) of the invention are applicable to the computer and data processing industries.

The foregoing describes only one embodiment of the present invention, and
5 modifications and/or changes can be made thereto without departing from the scope and spirit of the invention, the embodiment being illustrative and not restrictive.

The claims defining the invention are as follows:

1. A system for printing a print job from a local device to a remote printer being one of a set of printers, the system comprising:
 - 5 a local print process driver adapted to receive and prepare the local print job according to a first set of attributes;
a print application, adapted to receive the prepared print job and to print said job on the remote printer, the remote printer being compatible with the first set of attributes, the application being further adapted to update the local print process driver in regard to
10 attributes associated with the set of printers.
2. A system according to claim 1, wherein the preparation of the local print job comprises conversion of the local print job from a first page description language to a
15 second page description language.
3. A system according to claim 2, wherein the first page description language is Windows® GDI® and the second page description language is Postscript®.
4. A system according to any one of the preceding claims, wherein the preparation
20 of the local print job further comprises storing the prepared print job on the local device in anticipation of said reception and printing by the print application.
5. A system according to any one of the preceding claims, wherein the first set of attributes relate to capabilities of a printer rather than to physical attributes thereof.
25
6. A system according to either claim 1 or claim 5 wherein the first set of attributes is a sub-set of the attributes associated with the set of printers.
7. A system according to claim 6, wherein the sub-set includes one or more of a
30 page size, a print resolution, a page orientation, a color definition, and a printed medium definition.
8. A system according to either of claims 6 or 7, wherein the sub-set includes an explanatory graphical representation.

9. A system according to claim 1 wherein the print process driver updating is performed upon a communication being established between the print application and the print process driver.

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10. A system according to claim 9, the print process driver updating being dependent upon an update version number of the print process driver.

11. A print process driver adapted to receive and prepare, according to a first set of attributes, a local print job for printing on a remote printer being one of a set of printers, the first set of attributes being related to attributes associated with the set of printers, said print process driver being updated by a print application in regard to the associated attributes.

12. A print process driver according to claim 11, wherein the preparation of the local print job comprises conversion of the local print job from a first page description language to a second page description language.

13. A print process driver according to claim 12, wherein the first page description language is Windows® GDI® and the second page description language is Postscript®.

14. A print process driver according to any one of preceding claims 11 - 13, wherein the preparation of the local print job further comprises storing the prepared print job on the local device in anticipation of said reception and printing by the print application.

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15. A print process driver according to any one of preceding claims 11 - 14, wherein the first set of attributes relate to capabilities of a printer rather than to physical attributes thereof.

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16. A print process driver according to any one of preceding claims 11 - 15, wherein the first set of attributes is a sub-set of the attributes associated with the set of printers.

17. A print process driver according to claim 16, wherein the sub-set includes one or more of a page size, a print resolution, a page orientation, a color definition, and a printed medium definition.
- 5 18. A print process driver according to either of claims 16 or 17, wherein the sub-set includes an explanatory graphical representation.
19. A print process driver according to any one of preceding claims 11 - 18, wherein the print process driver updating is performed upon a communication being established
10 between the print application and the print process driver.
20. A print process driver according to claim 19, the print process driver updating being dependent upon an update version number of the print process driver.
- 15 21. A method of printing a print job from a local device to a remote printer being one of a set of printers, the method comprising the steps of:
receiving a local print job by a print process driver;
preparing the local print job according to a first set of attributes;
conveying the prepared print job to a print application, the application printing
20 the job on the remote printer, the printer being compatible with the first set of attributes;
and
updating by the print process driver in regard to attributes associated with the set of printers, said updating being performed in conjunction with the print application.
- 25 22. A computer program product including a computer readable medium having recorded thereon a computer program for printing a print job from a local device to a remote printer being one of a set of printers, the computer program comprising:
reception process steps for receiving a local print job by a print process driver;
preparation process steps for preparing the local print job according to a first set
30 of attributes;
conveying process steps for conveying the prepared print job to a print application, the application printing the job on the remote printer, the printer being compatible with the first set of attributes; and

updating process steps for updating by the print driver in regard to attributes associated with the set of printers, said updating being performed in conjunction with the print application.

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DATED this Twenty Ninth Day of September 1999

Canon Kabushiki Kaisha

Patent Attorneys for the Applicant

SPRUSON & FERGUSON

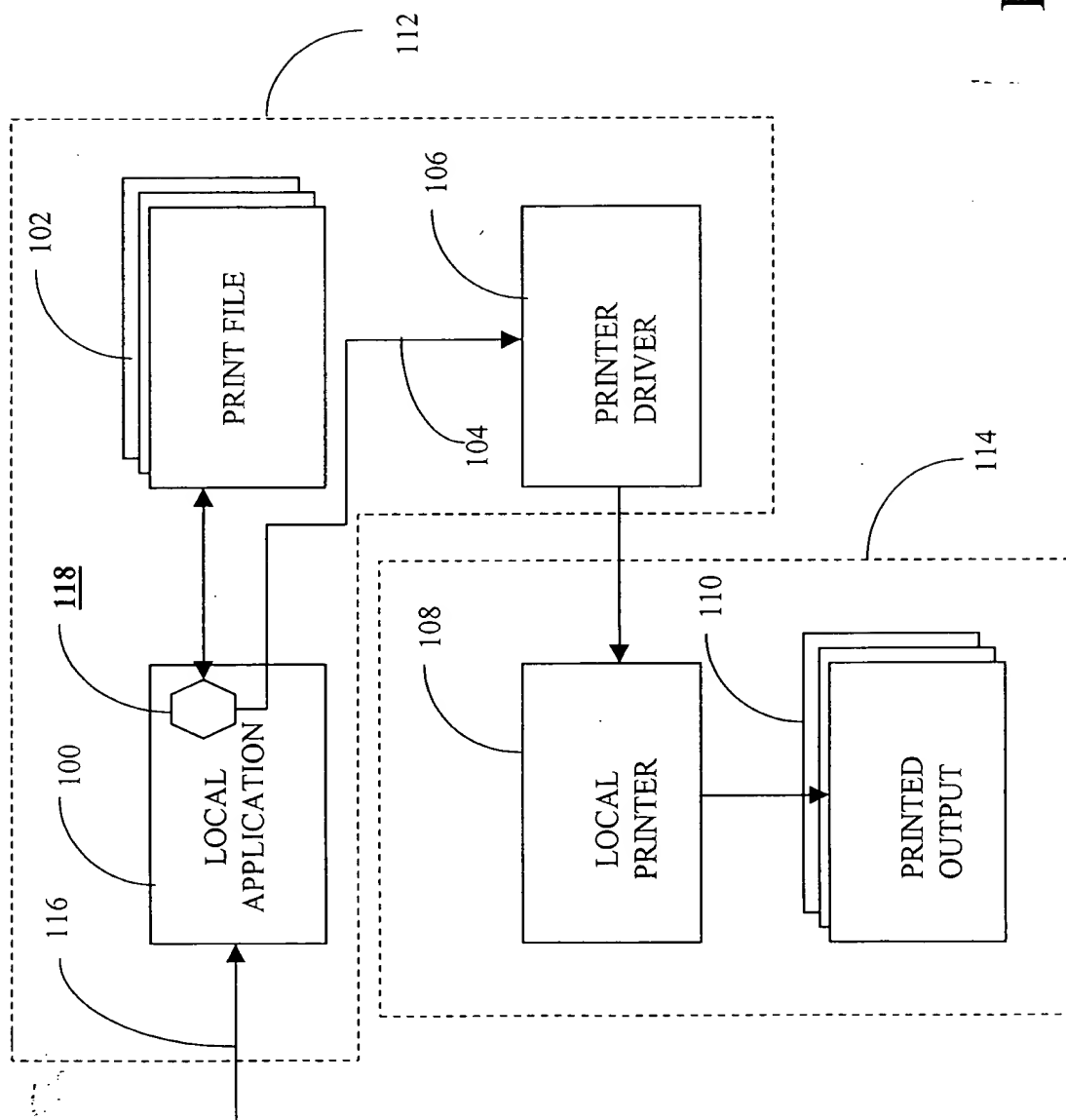


Fig. 1
(prior art)

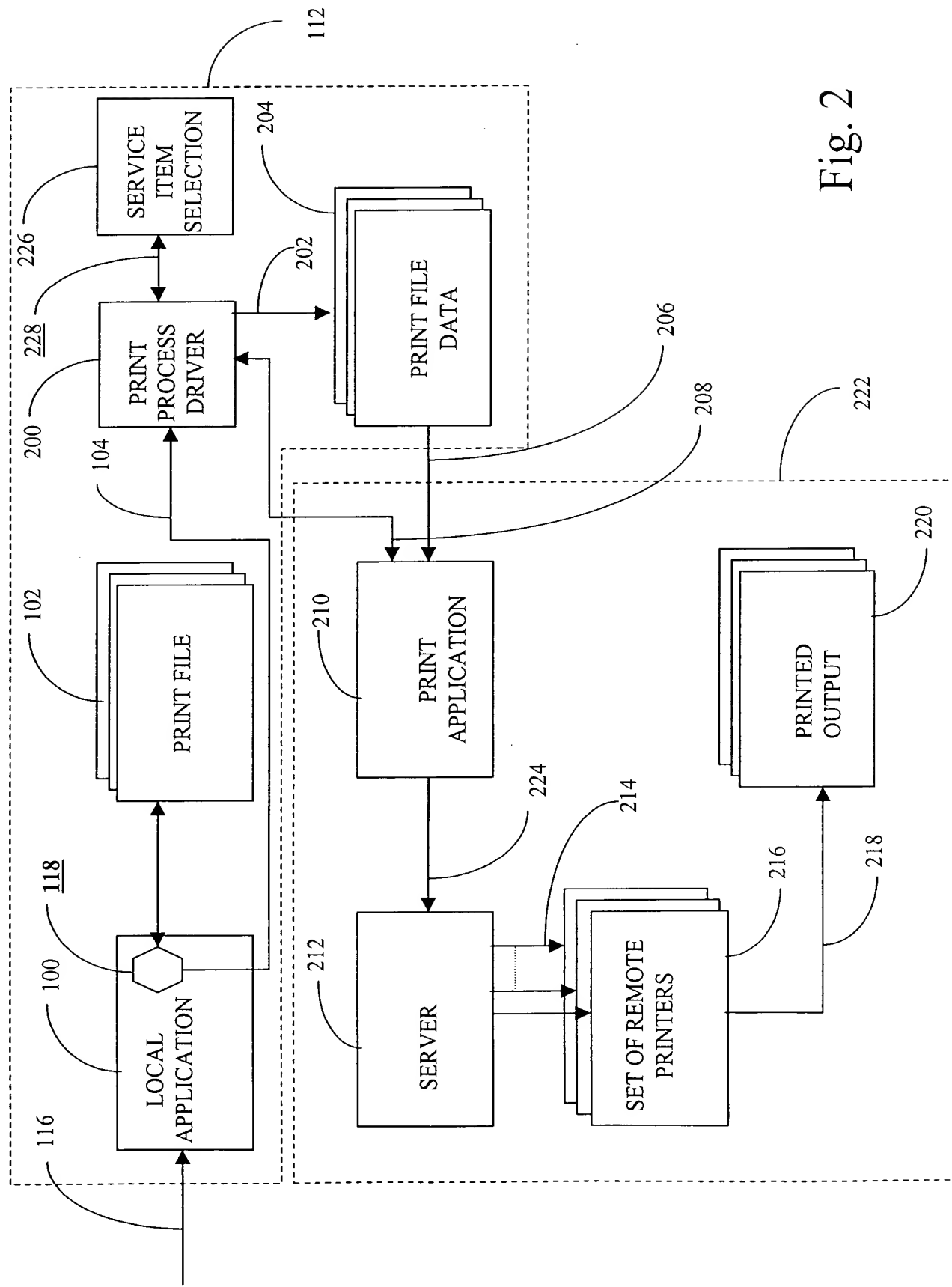


Fig. 2

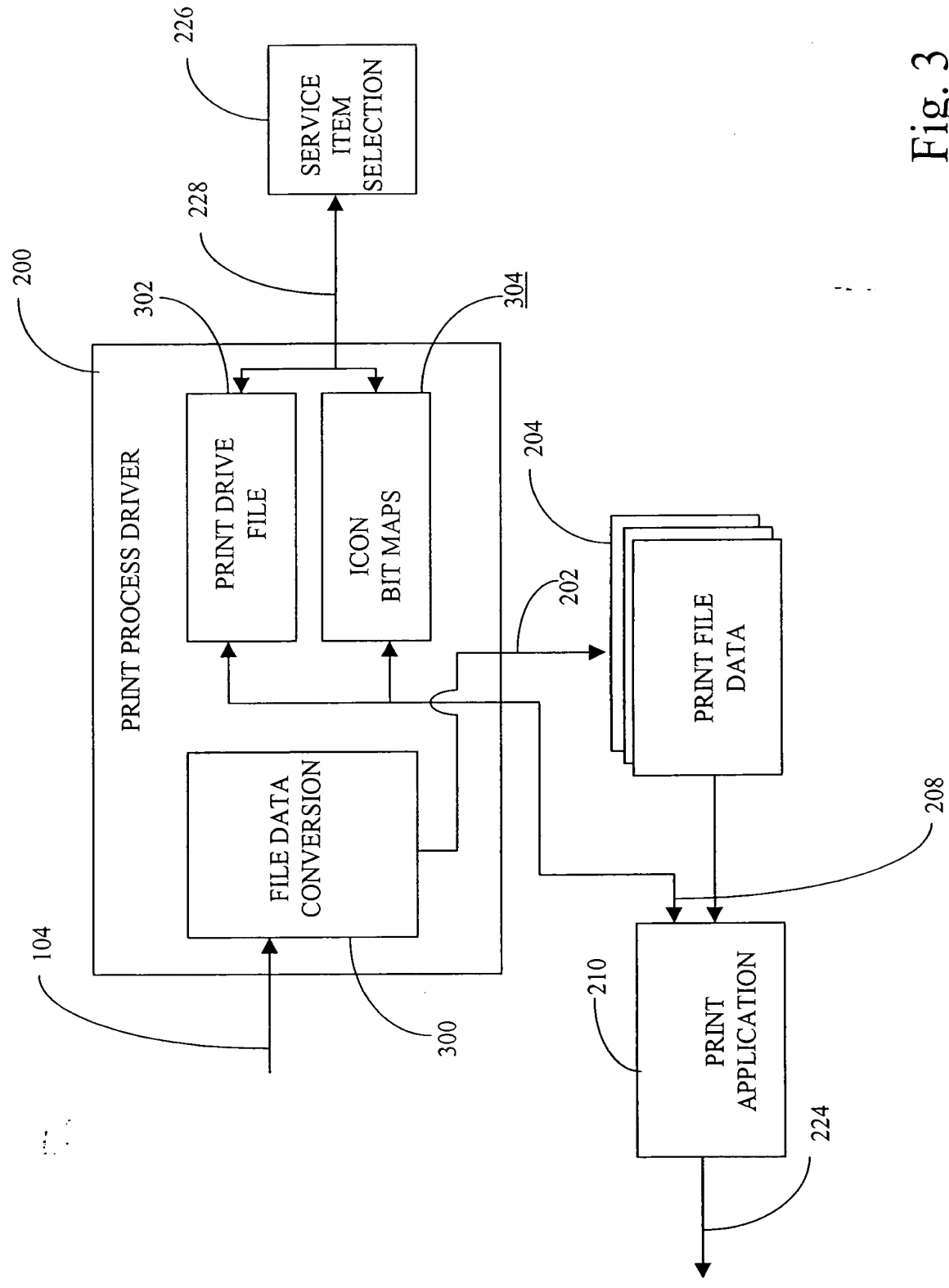


Fig. 3

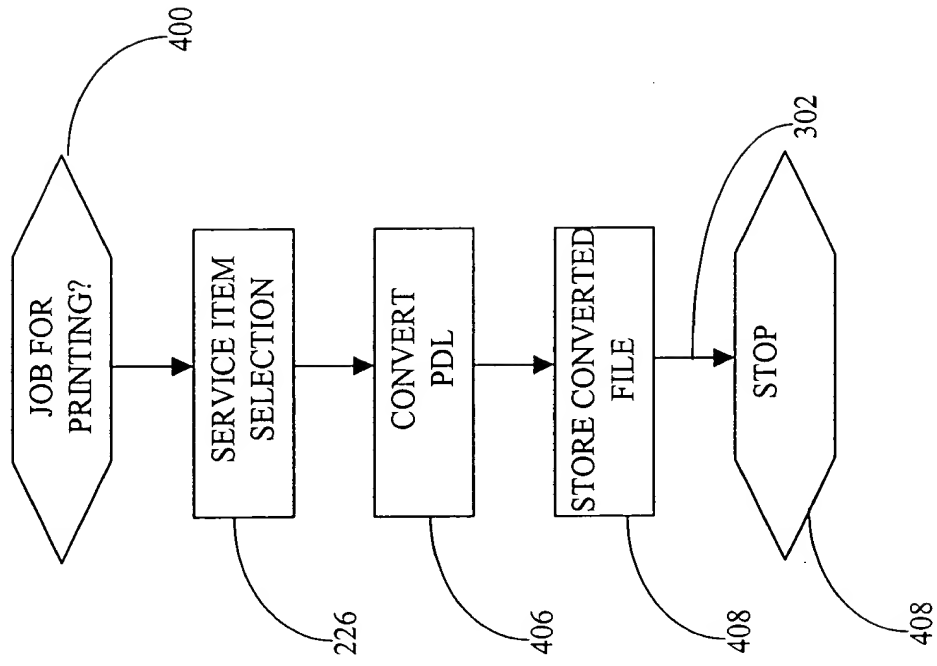


Fig. 4

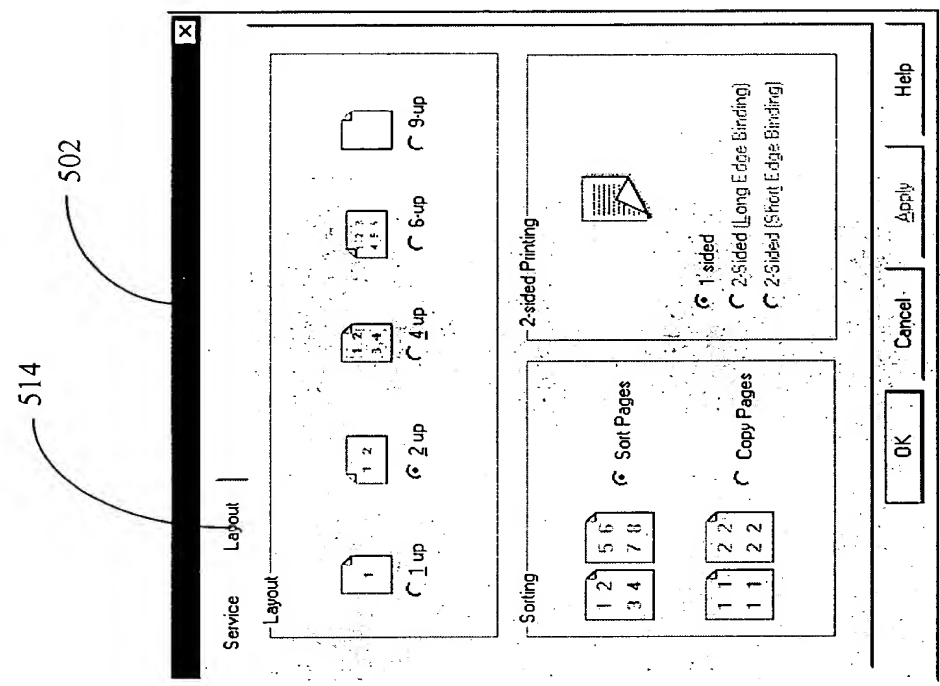
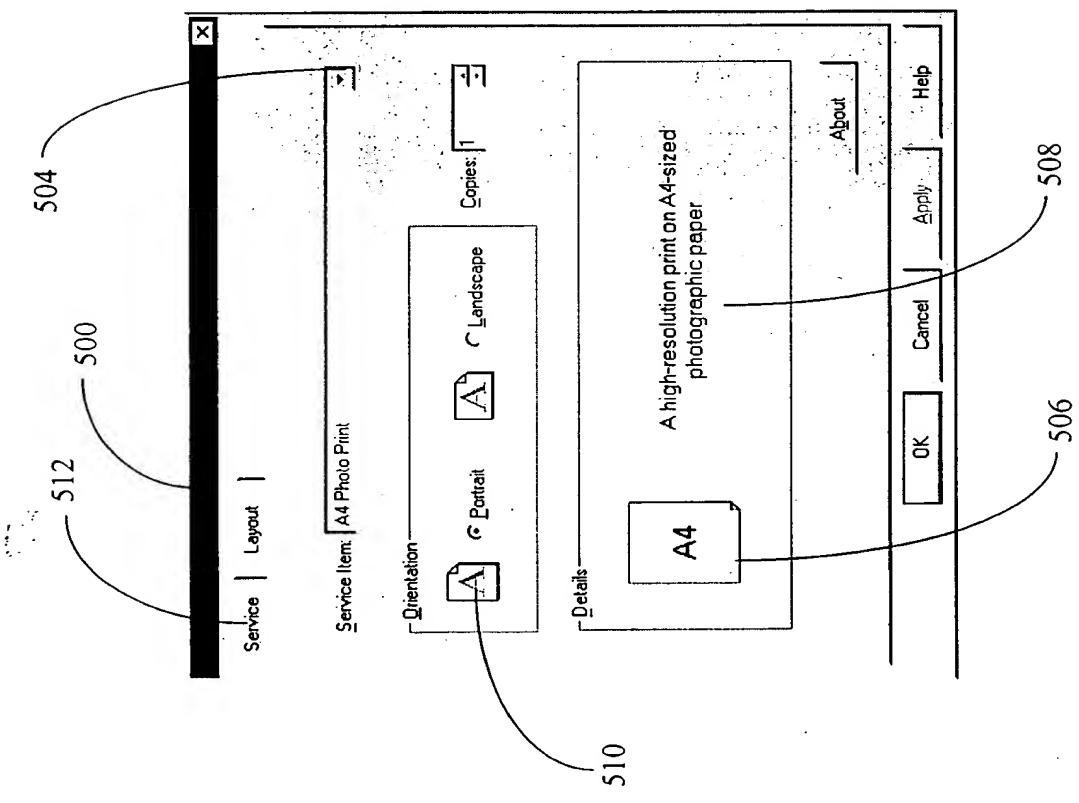


Fig. 5

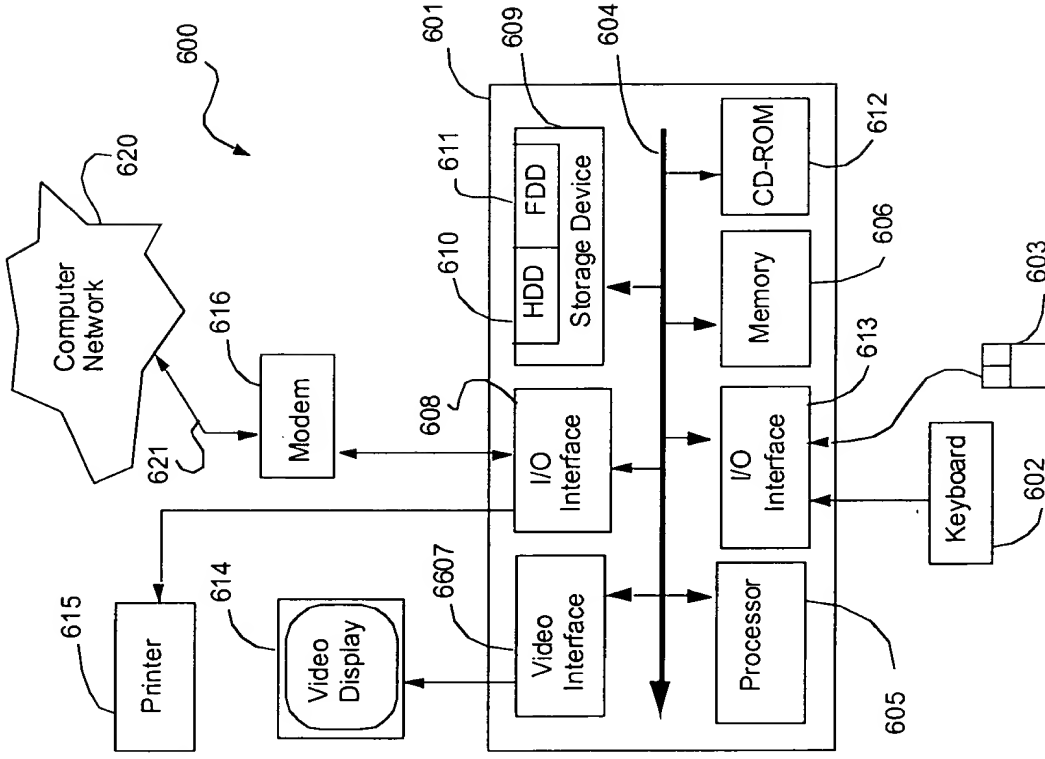


Fig. 6